

# Codelco implements LIMS to improve productivity and efficiency

The Corporacion Nacional del Cobre de Chile (Codelco) is the main copper producer in the world, controlling approximately 20 percent of the world's copper reserves. Codelco was created out of a Chilean constitutional reform that nationalized the copper industry. Codelco was established to operate and manage the mining properties given to the Chilean State as part of the reform.

Today, Codelco is a major employer in Chile, with almost 18,000 direct workers. The company reported 2017 pre-tax profit of \$2.885 billion, and produced 1.734 million tonnes of copper in 2017.

Codelco belongs to the Chilean State and its main business is exploring, developing and running mines that produce copper and by-products, processing the ore into refined copper and then selling it.

## The world's largest copper mining company

Codelco carries out mineral extraction and processing of copper, as well as sales and marketing of products like cathodes, copper and molybdenum concentrates.

Codelco's headquarters are based in Santiago and its exploitation, processing and shipment operations are carried out by its four mining divisions and one smelter refinery: Codelco Norte (fusion of former Chuquicamata and Radomiro Tomic Divisions), Salvador, El Teniente, Ventanas and Andina. Codelco also participates in mining, non-mining and business associations with other companies. It has a network of subsidiaries and sales agents backing up its commercialization activities.



Codelco selected Thermo Scientific™ SampleManager™ LIMS software for its Chuquicamata (now part of the Norte Division) facility. The LIMS was installed in one laboratory and several remote sampling sites. The functions of the laboratory include the preparation of raw materials, material process control, process control and finished product quality. Tests are run on solids, liquids and environmental materials.

SampleManager LIMS software replaced Codelco's existing LIMS and the project was managed by Codelco's Quality Management and Information System departments. The LIMS server is located in Chuquicamata with clients also in Santiago and Antofagasta, Chile.

At the time of the deployment, Codelco decided to introduce Good Laboratory Practice (GLP) into the organization and required a LIMS that would facilitate this process. Codelco determined that it was necessary to select an information management system that would horizontally integrate with the enterprise. In addition, Codelco required a LIMS that would also integrate several remote and networked systems into a unique and common platform.

Since Codelco had introduced GLP, the company had to conform to a number of external regulatory disciplines. The audit tracking and validation within SampleManager LIMS software conforms to ISO 9000, environmental testing to ISO 14000 and security of systems to ISO 18000. In addition, the organization is subject to regulations by the Chilean Health and Geological departments.

### **The project team and vendor selection**

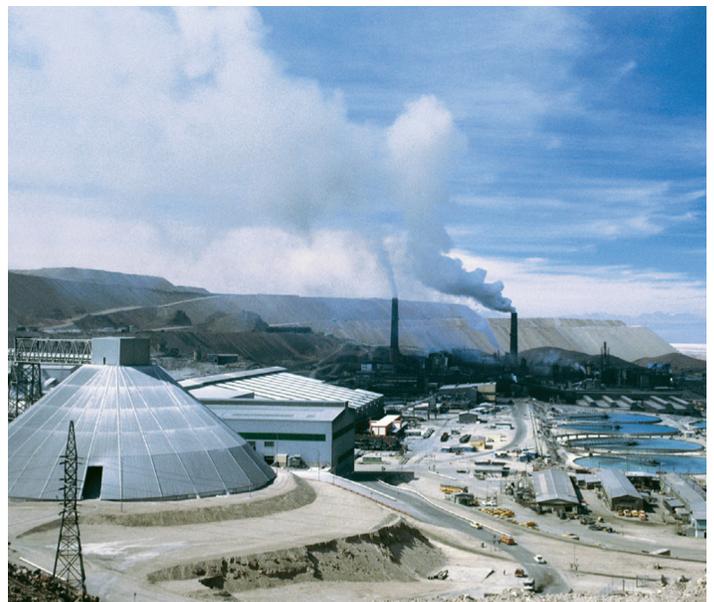
The Chuquicamata division appointed Ricardo Breve Inostroza (from the Safety, Quality and Environment department) as the User Project Manager and Jorge Navarrete Nunez (from the IS department) as the Project Manager. Inostroza and Nunez were in charge of evaluating the LIMS market and justifying the project from a technical and economic perspective. They designed and conducted the selection workshop and awarded the contract to Thermo Fisher Scientific.

Codelco's selection criteria were vast; however, a few key factors in selecting SampleManager LIMS software included:

- The quality of Thermo Fisher's response, workshops and project management capabilities
- Spanish language sales and support
- The LIMS' comprehensive functionality and alignment with Codelco's IT technology

For the project, Nunez drew on his vast experience of information technology project management. The LIMS' full client/server configuration, as well as the system's flexibility and interactivity, appealed to Nunez. He saw how SampleManager LIMS software was able to provide a natural integration between customers, samples, analyses and results. The LIMS was also flexible enough to be configured according to laboratory functions and to provide information in a format required by both customers and management.

"SampleManager LIMS software is adaptable to our organization's changes and business dynamics and works with other software applications such as Microsoft® Office and SAP®," said Nunez. "The system is also user friendly."



### **Instrument integration**

SampleManager LIMS software supports automated reports and information analysis that are used in production management decision-making for process and product quality. It also functions as a corporate database providing information to key organizations, such as product development, marketing, operations, etc. The LIMS supports Codelco's existing QC systems, such as ISO 9000, and interfaces to other information systems in the organization.

Instruments including balances, spectrometers, EAA, FRX and Leco are integrated directly into the LIMS to automatically collect data and provide laboratory statistics, such as workload, manhours, utilization of assets, budgets and cost of processes. It also tracks and audits samples, tests and results.

## **In conclusion**

Codelco's IS department was heavily involved in the LIMS project. Its role was to provide services in hardware, software, communication and development of business applications to improve productivity.

Sergio Espinoza Leon, the Laboratory Manager who was responsible for ensuring a smooth LIMS implementation, said, "We have had a very positive experience with Thermo Fisher in terms of effective communication, on-time delivery, system specifications and quality of documentation and records."

## **Partnering with Thermo Fisher Scientific**

Thermo Fisher Scientific is the worldwide leader in laboratory software and services, providing enterprise-wide, multi-laboratory solutions that are relied on at other minerals and mining companies, such as Minera San Cristóbal (Bolivia), Doña Inés de collahuasi (Chile) and Arcelor Brazil (CST). To support our installations, we provide implementation, validation, training, maintenance and support from the industry's largest worldwide informatics services network.

Find out more at [thermofisher.com/digitalscience](https://thermofisher.com/digitalscience)

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